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SCIENTIFIC ARTICLE

Correlation between weekly working time and burnout syndrome among anesthesiologists of Maceió-AL☆

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KEYWORDS
Burnout;
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Abstract
Background and objective: The current jobs are insufficient to determine the causative agent, as well as to identify characteristic high risk profiles for BS, leaving a clear need for more studies to this end. This study objective was to evaluate the correlation between weekly workload and BS dimensions.
Methods: An observational, descriptive, cross-sectional study performed with 43 anesthesiologists from Maceió-AL, with the application of Maslach Burnout Inventory (MBI) forms. Pearson's correlation coefficient *r* was used for the three dimensions and a 95% confidence interval for the prevalence of burnout syndrome and high scores in all three dimensions.
Results: Among the studied physicians, 51.16% were male and the average age was 49.82 ± 12.05 years. For physicians who have been diagnosed with BS through the MBI, the average weekly working time 69.27 ± 22.39 h. The high level of frequency in at least one of the three dimensions was found in 67.44% of physicians, with this percentage being considered diagnostic for burnout syndrome in this population.
Conclusion: This study showed no correlation between the weekly working time and the BS dimensions in this population.

PALAVRAS-CHAVE
Burnout;
Profissional;
Carga de trabalho;
Unidades de cuidados intensivos;

Correlação entre a carga horária semanal de trabalho com a síndrome de *burnout* entre os médicos anestesiologistas de Maceió-AL

Resumo
Justificativa e objetivo: Os trabalhos atuais são insuficientes para determinar o agente causal, assim como identificar perfis característicos de alto risco para síndrome de *burnout* (SB), e

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Estudos transversais;
Diagnóstico

deixam evidente a necessidade de mais pesquisas com esse objetivo. O presente estudo teve como objetivo avaliar a correlação entre a carga semanal de trabalho com as dimensões da SB.
Métodos: Estudo observacional descritivo e transversal feito com 43 médicos anestesiologistas de Maceió-AL, por meio da aplicação de formulários com o Maslach Burnout Inventory (MBI). Foi usado o teste de correlação R de Pearson para as três dimensões e um intervalo de confiança de 95% para a prevalência da síndrome de *burnout* e para escores altos nas três dimensões.
Resultados: Entre os médicos estudados, 51,16% pertenciam ao gênero masculino com média de 49,82 ± 12,05 anos. Para os médicos que por meio do MBI foram diagnosticados com SB, a média de carga horária semanal de trabalho foi de 69,27 ± 22,39 horas. A frequência de alto nível em pelo menos uma das três dimensões foi encontrada em 67,44% dos médicos, foi considerada essa a porcentagem de diagnóstico para a síndrome de *burnout* na população estudada.
Conclusão: O presente estudo demonstra não haver correlação entre a carga horária semanal de trabalho com as dimensões da SB na população estudada.

Introduction

Burnout syndrome (BS) is closely related to work and it has become increasingly present in the medical routine, as doctors are constantly subjected to high workloads, accumulation of functions, poor wages, stressful work environment, multiple jobs, among other factors.[1] Despite occupying a good time of the daily routine, the work does not necessarily bring professional satisfaction.[2] It was in this context that Freudenberger formulated the staff burnout expression, characterized by physical exhaustion combined with psychosocial behavioral changes.[3]

Characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, BS becomes typical for the health areas that involve human relationships, productivity, professional recognition, and energy expenditure that may generate professional failure.[4] Emotional exhaustion is marked by emotional exhaustion. Thus, professionals come to believe that they no longer have the energy to deal with patients. Regarding depersonalization, it makes health professionals insensitive, which leads them to treat patients and colleagues as objects without value. The reduction of professional achievement, in its turn, reveals employee dissatisfaction with their performance at work leading them to believe that their functions are no longer carried out due to lack of energy.[5]

The impact of professional exhaustion and its consequences on physician's health has aroused national and international scientific interest. In 2007, in the study *A saúde do médico no Brasil* (The physician's health in Brazil), the Federal Council of Medicine identified, among other things, that of the 2364 physicians participating in the work, 57% had some worrying degree of BS, from moderate to severe. In a study conducted among Brazilian oncologists, a 52.3% prevalence of the syndrome was identified.[6] Similarly, in a study performed in the United States (US), in order to compare the prevalence of BS among physicians and the US general population, it was identified a prevalence of 37.9% and 23.5%, respectively.[7]

Regarding the anesthesiology field, the occupational health of this medical specialty has attracted more attention. In 2011, Duval Neto et al. drew attention to the need for greater care and concern for the occupational health of Brazilian anesthesiologists, by the doctors themselves, the State and the governmental organizations.[8] According to the article, in recent decades, innovations and increasing changes in the daily activities of the specialty, with changes in the technological framework and greater challenge at work, in addition to the increasingly complex cases, caused a strong impact on the occupational well-being of anesthesiologists.

The current reports are insufficient to determine the causal agent, as well as to identify the characteristic high risk profiles for BS, making clear the need for more research for this purpose.[9,10] The aim of this study was to evaluate the correlation between the weekly workload and the BS dimensions.

Material and methods

This was a descriptive cross-sectional observational study, in which data were collected among anesthesiologists of Maceió-AL, from March till May 2014, in public and private hospitals. Before data collection, the study was submitted to the *Plataforma Brasil* for proper approval and the Ethics and Research Committee of the Federal University of Alagoas (Ufal) authorization.

For selection of physicians, we reviewed a list of 150 anesthesiologists, which was provided by the Anesthesiology Society of the State of Alagoas (Saeal). We conducted a draw of 43 doctors, who were given the survey forms with the Maslach Burnout Inventory (MBI).

Participants signed the Informed Consent (IC), in which the researcher was responsible for keeping confidential the data provided by the doctor that only could be used as a research tool. After which, in accordance with the term, the data were completely discarded, in order to prevent loss and misuse. Furthermore, the term listed risks and benefits

to the participant, leaving him free to participate or not in the research. This agreement was made in accordance with the Ufal Ethics and Research Committee model and also in accordance with the Resolution 466/12 of the National Health Council (CNS).

The investigators contacted doctors in three public hospitals and two private hospitals in Maceió-AL. In every visit made in the operating room the investigators exposed the research and its objectives and showed the need to detect the presence of the syndrome in the field of these professionals. Doctors answered the inventory without interference from investigators.

The inclusion criteria were doctors trained in medicine and with anesthesiology specialization, with regular employment and registration in the Alagoas Regional Medical Council (Cremal). The exclusion criteria were incomplete MBI questionnaires and failure to fill the weekly working hours.

We used the MBI, prepared by Christina Maslach and Susan Jackson, which is a questionnaire formed by three dimensions: emotional exhaustion, depersonalization, and reduced personal accomplishment, consisting of 22 questions with five options for each question (scale from 1 to 5).[11] The BS indices are identified from the values obtained in each evaluated dimension. Regarding emotional exhaustion, its high level detection is identified with a score higher than or equal to 27, whereas the moderate level is detected with values between 19 and 26, and values below 19 detects a low level of emotional exhaustion.[11] For depersonalization, the high level is detected with values greater than or equal to 10, whereas values between six and nine detect a moderate level and smaller than six detect a low level of depersonalization.[11] Conversely to other dimensions evaluated, personal accomplishment is detected with a smaller number of points.[11] Values between 0 and 33 indicate high level, while values between 34 and 39 indicate moderate level and values greater than or equal to 40 indicate low level.[11] BS diagnosis was made according to the Grunfeld et al. model, which requires the presence of only one high-level score.[12]

As for the form, it initially requested general information, such as name (optional), completion date, gender, and date of birth. In a second group, questions were asked about work and life habits, such as marital status, having children, having specialist title, total working time (years) in anesthesiology, type of working establishment, weekly working hours on duty, among others. In the third group, questions were asked about the physician health status, in which all his health status was outlined, specifying disorders that he may have, and finally, in the fourth group, it was asked questions regarding stress in the workplace.

The primary variables were frequency of BS in anesthesiologists and the average weekly working hours on duty of respondents. As secondary variables, we highlighted the type of medical specialty, professional working time and graduation, type of working establishment, work shifts, number of night shifts, uninterrupted duty time, recreation, number of cigarettes smoked per day and number of days consuming alcohol per week, presence of any chronic disease and which one, symptoms, signs and disorders associated with BS, behavioral and psychological symptoms, as well as work factors that are considered by the participants as stressful or harmful to health.

Symptoms, signs, and disorders associated with BS were characterized by progressive and constant fatigue, sleep disorders (sleep apnea, excessive sleepiness, insomnia, and snoring), muscle or musculoskeletal pain, headache, migraine, immunodeficiency, cardiovascular diseases, respiratory system disorders, sexual dysfunction (impotence or loss of libido), or none of the above options.

The psychological and behavioral symptoms proposed were: lack of attention and concentration, memory impairment, slower thinking, feeling of alienation, feelings of loneliness, impatience, feeling of inadequacy, increased aggressiveness, inability to relax, difficulty in accepting changes, loss of initiative, increased consumption of drugs, tendency to isolation, feelings of omnipotence, emotional instability, loss of interest in work or pleasure, difficulty in self-acceptance, absenteeism, asthenia, depression, irony, cynicism, distrust, irritability, or none of the above options.

Some factors that may exist in the workplace and are stressful and harmful to the physician's health have been proposed, such as excessive noise in the operating room, possibility of complications, relationship with the team during care of patients, management of high-risk patient, administrative problems, pressure to discharge patients, dealing with suffering and death, difficulty sleeping at night shifts, obligation to deal with several issues simultaneously, work in the operating and/or emergency room, number of patients per doctor, rapid pace of professional activities, lack of material resources, and none of the above options.

For sample size calculation, we used the electronic calculator available at http://www.lee.dante.br/pesquisa/amostragem/amostra.html. It was needed 43 anesthesiologists, with a correlation between the scores of MBI and weekly workload of 0.3; a significance level of 5% and 80% test power. A 95% confidence interval was used for both BS prevalence and high scores in the three dimensions. For the number of children, we used median and interquartile range. Pearson's correlation in R was used for the three axes.

Results

Forty-three anesthesiologists working in night shifts were included. To achieve this number, three draws using the names present in the Saeal list were needed, as 15 randomly selected physicians were in a situation of exclusion, as well as not exercising the activity or had refused to participate. The completed forms were evaluated for MBI and other variables. The prevalence of BS in the study population was 67.44% (29/43, 53.43–81.45%).

Of the physicians participating in the study, 51.16% (22/43) were male, mean age of 49.82 ± 12.05 years. Regarding marital status, 69.77% (30/43) declared themselves as married, 16.28% (7/43) as singles, and 13.95% (6/43) as divorced or widowed. Among the studied anesthesiologists, 76.74% (33/43) have children, with median and interquartile range of 2 (1–3).

Regarding title of specialist in anesthesiology, 97.68% (42/43) declared having a title, and of these, 16.67% (7/42) also have titles in other areas (acupuncture, pain, occupational health, and hospital administration). Regarding the

workplace, 93.04% (40/43) work in both public and private institutions, 2.32% (1/43) reported working only in public institutions, 2.32% (1/43) only in private institutions, and 2.32% (1/43) declined to answer this question.

The physician's average weekly working hours on duty in anesthesiology was 63.64 ± 22.39 h. For physicians diagnosed with BS through the MBI, with the diagnostic criteria as explained in the methodology, the average weekly working hours was 69.27 ± 22.39 h. For those who did not receive a positive diagnosis, the average weekly duty time was 51.08 ± 18.74 h. For all participants, the average of the longest weekly duty time was 27.09 ± 17.18 h, whereas for those diagnosed with BS it was 30.69 ± 16.28 h, and for those who did not receive this diagnosis it was, on average, 19.08 ± 17 h.

Life habits, including the harmful ones, were also addressed, such as leisure time, physical activity, smoking and alcohol consumption. The average leisure time per week was 28.71 ± 16.32 h. Regarding physical activity, 60.47% (26/43) reported engaging in regular physical activity, with bodybuilding and walking being the most cited activities. The BS prevalence among those engaged in physical activity was 61.54% (16/26) and 76.47% (13/17) among those not engaged in such activity. None of the assessed physicians reported being a smoker and 72.09% (31/43) reported alcohol consumption. Despite the difficulty in estimating the amount of weekly alcohol consumption, 54.84% (17/31) consume one to three glasses (200 mL) per week, 22.58% (7/31) less than one glass, and 22.58% (7/31) more than three glasses of alcohol per week. Regarding the type of alcohol consumed, the most frequently reported were beer, wine, whiskey, sparkling wine and vodka.

Regarding general health conditions, 62.79% (27/43) reported having some diagnosed chronic disease, the most frequently reported were hypertension, sleep disorders, and allergies. Regarding the presence of signs and symptoms that could be possible consequences of BS, the most reported were muscle or musculoskeletal pain by 46.51% (20/43), sleep disorders by 41.86% (18/43), headache by 23.25% (10/43), and steady and progressive fatigue by 20.93% (9/43) of physicians. Only 13.95% (6/43) reported not having any of the questioned signs and symptoms.

In the population studied, between the psychological and behavioral symptoms related to BS, the standing out ones were impatience reported by 55.81% (24/43) and irritability reported by 48.84% (21/43) of physicians. Among other symptoms, the most common were lack of attention and concentration in 27.91% (12/43), memory impairment in 27.91% (12/43), discouragement in 25.58% (11/43), emotional instability in 23.25% (10/43), inability to relax in 20.93% (9/43), in addition to slower thinking, asthenia, and increased aggression, which were reported by 16.28% (7/43). Only 11.63% (5/43) of the physicians reported having none of the psychological symptoms mentioned.

When asked about the work environment, the study physicians pointed out many factors that are stressful and harmful to health and contribute to the development of SB. Only 6.98% (3/43) said not being affected by these factors. The main elements highlighted were lack of material resources by 67.44% (29/43) and the possibility of complications in the management of their patients by 53.49% (23/43). The presence of both excessive noise in the workplace and the occurrence of administrative problems were mentioned by 46.51% (20/43), trouble sleeping in night shifts were reported by 41.86% (18/43), and the number of patients per doctor by 34.88% (15/43). Other elements also considered stressful and possibly interfering with health appeared less frequently, such as fast-pace work environment, requirement to handle multiple concurrent issues, and staff low commitment, which were reported by 27.91% (12/43).

Still regarding the work environment, 23.25% (10/43) reported feeling uncomfortable with the establishment frequent changes of rules and regulations, 20.93% (9/43) feel prevented from acting according to their principles in the workplace, 18.6% (8/43) feel they have communication problems with the organizers, and 16.28% (7/43) feel that production is hampered by the low quality of the work atmosphere.

In the MBI assessment, the high frequency level in at least one of the three dimensions (emotional exhaustion, depersonalization, and personal accomplishment) was found in 67.44% (29/43, 53.43% to 81.45%). Thus, this percentage was considered diagnostic for BS in the population studied. The frequency of high level scores on the three axes was only found in 9.3% (4/43, 0.62% to 17.98%). In evaluating each dimension separately, we found high level of emotional exhaustion in 25.58% (11/43, 12.54% to 38.62%), high level of personal accomplishment in 51.16% (22/43; 36.22% to 66.10%) and depersonalization in 44.19% (19/43; 29.35% to 59.03%).

Pearson's correlation coefficient R was used to correlate the three dimensions of BS with the weekly workload. Only the data from physicians diagnosed with IBS were used for the test. None of the three dimensions correlated significantly with the weekly working hours (Table 1).

Table 1 Correlation between weekly working hours and each of the three burnout syndrome dimensions.

Dimensions	*r*	*p*-Value
Emotional exhaustion	−0.1014	0.7759
Depersonalization	−0.2545	0.2930
Personal accomplishment	+0.4084	0.0592

Pearson's correlation in *R*. *r*: correlation value

Discussion

The individual's relationship with work, and its consequences, has been increasingly recognized in the modern era due to increased job demands. In the United States, the term ''burnout'' came into use in the 1970s when the relationship between the individual and his work goes awry.[13] The three

dimensions of BS are emotional exhaustion, depersonalization and reduced personal accomplishment.[13] Occupational demands can deplete the individual, leading him to emotional exhaustion.[13] Despite being the most studied and evaluated dimension, it should not be viewed alone, as it fails to capture the critical aspects of the relationship with work.[13] Depersonalization is an attempt to detach from labor activities, in which the quality of interpersonal relationship is lost.[13] With the feeling of inefficiency and indifference at work, the individual begins to develop a low personal accomplishment.[13] The three dimensions may be developed sequentially or in parallel.[13]

According to Murofuse et al., the BS onset is triggered by progressive levels of stress, which can be diagnosed based on perspectives: clinical, socio-psychological, organizational, and socio-historical.[4] Freudenberger proposed the clinical perspective, stating that emotional exhaustion leads to the denial of one's own needs.[3] Maslach and Jackson proposed that chronic emotional stress related to caring for others would be responsible for professional burnout and BS would be the socio-psychological approach.[11] In the organization, a stressful and frustrating or monotonous work leads to BS and causes impossibility of carrying out the work.[4] Finally, in the socio-historical perspective, social conditions would be responsible for the loss of interpersonal relationships.[14]

Although BS is not inherent to anesthesiology or other specialties, there is a greater susceptibility of health professionals, as the arduous search for knowledge, combined with the health system failures, requires the adaptation of the professional.[15] In a more current picture, this trend was demonstrated in an American study that comparing physicians with the general population found an increased risk in the medical population for developing emotional exhaustion and depersonalization.[7]

Complaints related to excessive dedication to work and lack of time with family have been increasingly more frequent among physicians.[16] Thus, the time dedicated to work has been identified as an important stressor by these professionals and, therefore, an important risk factor to be investigated. It was precisely this factor that the current study aimed to investigate. We investigate any correlation between the weekly working hours of Maceió anesthesiologists and BS dimensions. However, no significant correlation was found in the studied sample, a result similar to that found in a study with other doctors of Maceió,[17] but different from that of Shanafelt et al. in which the weekly working hours were associated with the risk of developing BS in US physicians.[7]

For BS measurement, the Maslach questionnaire (MBI) was used, chosen for being the most used for this purpose and having the strongest psychometric properties,[13,18] in addition to enabling the description and evaluation of the three dimensions separately.

All studied physicians completed the MBI properly. However, the present study has some limitations, which should be addressed in future work. The main limitations were the physician's approach at his workplace, which meant that the questionnaire was answered quickly; the fact that not all Maceió anesthesiologists are registered in Saeal, which did not give the same chance to other doctors of Maceió and precluded the possibility of other SB diagnostics; the study was restricted to Maceió, making it impossible to evaluate the conditions of the other municipalities of Alagoas regarding the prevalence of BS.

Although there is no standardization for a proper form of BS diagnosis with the use of MBI, in this study it was diagnosed according to Grunfeld et al. that define professional burnout in the presence of at least one high level,[12] and thus it is a very sensitive method, but little specific. The frequency BS found in the sample was 67.44%, slightly below that found for the group of intensivists, which was 70.14%,[17] but above that found in a sample of oncologists, which was 52.3%.[6] A broader comparison is hampered by the lack of standardization in diagnosis. If the criterion of Ramirez et al. was followed, which defines burnout as the presence of a high level score in three dimensions,[19] only four out of 19 of the 43 physicians would be diagnosed with BS. The low prevalence of BS when the latter criterion is used is found in the literature.[6,20] This last diagnostic form has the disadvantage of being more specific and less sensitive, and may fail to diagnose positive cases for SB.

In the population studied, the dimension that had the highest frequency of high score was personal accomplishment, indicating reduced personal accomplishment in 22 of the physicians, followed by depersonalization in 19, and emotional exhaustion was the least frequent, present in only 11. The reduced personal accomplishment as the most frequent dimension in the study population is parallel to that found in a similar study performed in Maceio,[17] but opposite to that found by Tucunduva et al., who reported this dimension as the least frequent.[6] Reduced personal accomplishment is considered by Maslach as the last one to be developed, being influenced by emotional exhaustion and depersonalization in the individual with BS.[13]

The inventory used as a tool in the study was not only the MBI, but many other data and variables that allowed us a better understanding of the personal life and work conditions of each physician. However, unlike the MBI, which was completely filled by all participants, which allowed the inclusion in the work, not all physicians responded to other data with the same care and attention, which hampered its standardization and interpretation in a few points. This is probably due to the physicians' approach in their workplace.

The anesthesiologists' profile consisted of an adult population with mean age of 49.82 years and a slight predominance of male. Of the 29 physicians with BS, 16 are men. This greater prevalence counteracts the one found in the literature, in which female is regarded as more susceptible to BS.[6] Of the physicians surveyed, 69.77% and 76.74% are married, have children and, although there is no general agreement on the impact of marital status in the development of BS,[21] a major study found correlation between lack of family support on a daily basis and higher incidence of BS.[6] Therefore, a stable family life is an important protective factor.

In this sample, it became clear that complaints regarding the working environment have become common among physicians. Lack of material resources, presence of noise, administrative problems, possibility of complications in patient management, and the number of patients per doctor stood out as important stressor elements, in addition to the uneasiness with frequent changes in rules and regulations, difficulty in communication with organizers, and impairment due to the workplace environment poor quality, which have

been reported as a present reality in the daily lives of some of the studied physicians.

Regarding the title of specialist in anesthesiology, 97.68% responded affirmatively, a higher proportion than that found in a similar study.[22] Appropriate medical specialization, followed by constant update allows the professional to be sure of his labor activities. Insecurity was reported by Maslach et al., along with work overload, as a factor related to the development of BS.[13] However, despite the safer practice regarding specialization, the practice of night shifts in the activity leaves the anesthesiologist in vulnerable condition, as shift work is considered a factor related to the development of the BS, with individuals who alternate night and daytime activities with changes in periods of two to three days being the most susceptible.[23] Trouble sleeping on night shifts was mentioned as a stress factor by 41.86% of the study physicians.

Among the study sample, 60.47% have healthy lifestyle habits related to regular physical activity, prevalence higher than that found in the study with anesthesiologists from the ABC School of Medicine.[24] The same study revealed that physical activity allows better adaptation, causes a reduction in the degree of depersonalization,[24] strengthened the present study results, in which a higher prevalence of BS occurred among doctors who do not exercise. Regarding alcohol consumption, despite being a habit confirmed by 72.09% of the doctors, it was not possible to determine it as an excessive and harmful habit to health or with reflection of a stressful work activity.

Exhaustion induced by BS can cause many damages to the physical and mental health of the individual.[21] Among those already reported in the literature,[21] the most frequent in the study physicians were muscle and musculoskeletal pain, sleep disorders, headache, and fatigue. As for the psychological and behavioral symptoms related to BS, the most reported were impatience and irritability, as well as lack of attention and concentration, memory changes, depression, emotional instability, inability to relax, slower thinking, asthenia, and increased aggressiveness.

Although it was not found any significant correlation between the weekly working hours and BS in the studied sample, it does not mean that a heavy workload is not harmful. Excessive dedication to work and lack of time with the family,[16] which, together with other working conditions, constitute an unwholesome environment for health.

The implications for future research are: avoiding the approach of volunteers in their workplace; the need to assess correlation with other variables, such as noise levels, level of satisfaction, coexisting diseases. For sample size calculation using the present study parameters (95% confidence interval, 5% α, and 20% β), 143 participants will be required and a diagnostic criterion with the presence of at least one dimension with high score (prevalence of 70% for BS) or 61 participants if using a diagnostic criterion requiring the presence of high scores for the three dimensions of BS (prevalence of 10% for BS).

Conclusion

The study results show no correlation between the weekly working hours and BS dimensions in the population studied.

Conflicts of interest

The authors declare no conflicts of interest.

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